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Spread of Pollution Feared In Wells Around New York

By ROBERT HANLEY

In the last three years, more than 600 ground water wells have been closed in the New York metropolitan area because of contamination by chemicals, and public health and environmental officials fear that thousands more may be jeopardized in coming years.

The ruined wells are only a small fraction of the hundreds of thousands thought to be in use in New York, New Jersey and Connecticut. But the officials say that the threat could spread as "plumes" of toxic organic chemicals move slowly through ground water aquifers in the three-state area.

Tainted wells shut since 1978 include at least 455 in New Jersey, 50 in Connecticut, 51 in Putnam County, 23 in Nassau, 19 in Suffolk, 20 in Rockland, and 11 in Westchester. In addition, several hundred homes in the Town of Babylon on Long Island have been connected to municipal water supplies because of well contamination, according to Dennis Lynch, Babylon's Commissioner for Environmental Quality.

Some of the chemicals that can be detected in minute traces in aquifers, using new and highly specialized equipment, cause cancer in mice and other laboratory animals. Whether ground water users will contract cancer or other ailments from ingesting the chemicals is still unknown and a subject of considerable debate among toxicologists and scientists.

No Data on Risk

"Nobody knows exactly what the risk is," says Dr. Nancy K. Kim, a scientist in the New York Department of Health and co-author of a state report, "Organic Chemicals and Drinking Water." "These chemicals don't belong in drinking water. Our policy is that they should be kept at a minimum. But if I have to prove they're a danger to humans I can't, because the data's not there."

The Federal Environmental Protection Agency is expected to set formal safety standards in coming months for organic chemicals in ground water. Until it does, local and state health officials refuse to speculate about absolute health risks. However, they are becoming more forthright in discussing the extent of ground water contamination and expressing concern because of the importance of aquifers as a source of water in the region.

Long Island's 2.5 million residents are supplied solely by three ground water aquifers underlying the entire island. About half of New Jersey's 7.3 million people and 38.5 percent of Connecticut's 3.1 million residents rely on ground water.

The wells that have been shut in the three states supply both municipal systems and individual homes. However, officials say that the total number of people affected cannot be estimated.

Danger to Aquifers Rises

The aquifers — whether in the bedrock of North Jersey, southern New York and Connecticut, or the sand and gravel left by retreating glaciers in the ice age in South Jersey or Long Island — had long been considered pristine repositories of pure, cold and fresh water. But no more.

Haig F. Kasabach, chief of New Jersey's Bureau of Ground Water Management, said in a recent interview: "Virtually every aquifer in the state has some chemical or other in it. But they are not there on a very large scale."

Mr. Kasabach's assistant, William F. Althoff, said it was "a very safe assump-

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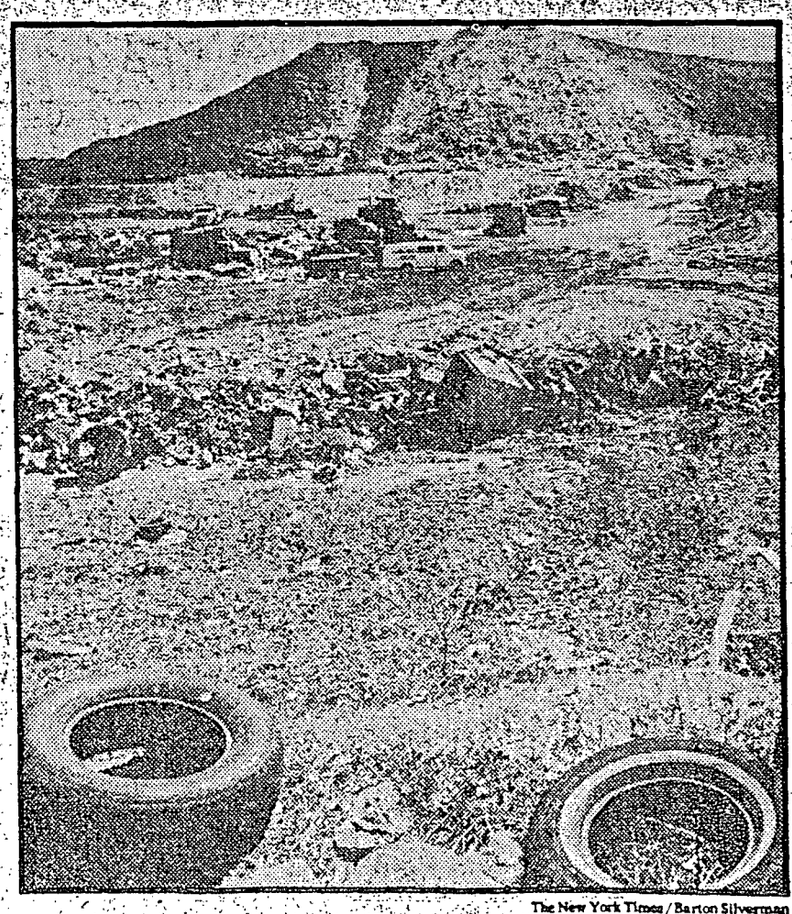

The New York Times / Barton Silverman

Landfill in the Town of Babylon, L.I., is the reported source of a contamination plume that extends about a mile and has polluted water wells in the area.

Chemical Threat to Well W

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tion" that officials were not aware of all the ground water pollution.

Long Island's uppermost aquifer, the glacial, which ranges as deep as 150 feet, is little used as a potable water source in Nassau County because of contamination.

Pollution is less severe, but still present, in the two other aquifers in Nassau — the Magothy, which now supplies 88 percent of the county's water and goes as deep as 600 feet near the South Shore, and the Lloyd, Long Island's deepest aquifer and its last water reserve.

In a report completed in January, Frank V. Padar, Nassau's deputy health commissioner, said that pesticides, herbicides or organic chemicals had been found in 107, or 35 percent, of 305 wells sampled in the Magothy aquifer. In the Lloyd, 7 of 29 wells tested, or 24 percent, were tainted with the same substances.

But none of the contaminated wells found in the Magothy and Lloyd aquifers were beyond the safety guidelines now used by New York State's Health Department, Mr. Padar said.

The most recent cases of contamination and closings have occurred in Lake Carmel, N.Y., a community of relatively young families that has grown in recent years with the conversion of summer bungalows into year-round homes. Since late 1979, the state has ordered 32 private wells closed because the water contained hydrocarbons — organic chemicals, including benzene, a known cause of leukemia, that usually come from leaking underground storage tanks for gasoline and fuel oil.

Medical Mysteries

Among the 32 is the 200-foot-deep well of Nancy and Hugh Sheridan. Their water was declared unfit for drinking by the state last August. But the young family continues to use it for bathing and washing clothes and dishes. The Sheridans' four children, all younger than 5 years of age, have suffered nagging ailments for months, their mother says.

"They've all had deep congestion and bronchial coughs, sore throats and rashes all over their bodies," Mrs. Sheridan said the other day in a telephone interview. "The doctor's not sure what it might be."

Besides the coughs and rashes, the children have other persistent discomforts. The baby, Sarah-Jane, 19 months, has frequent diarrhea. Megan-Emily, 3, urinates often, sometimes 10 times an hour, her mother says. Jennifer-Rebeccah, 5, has chronic stomach aches. Mrs. Sheridan, 26, has periodic coughs and was hospitalized for pains in her right side. Gall bladder trouble was suspected, but hospital tests ruled it out. "The doctor doesn't know what it is," she said.

Whenever the family visits relatives in Cape Cod or in Watertown, in upstate New York, for a week or two, Mrs. Sheridan said the children's ailments disappear. "But they always come back when we come home," she said.

Rashes and Bronchial Problems

The Sheridans' neighbor, Joanne Nappi, attributes her unexplained high white blood cell count, painfully swollen joints, and a "pigmentation of the kidney" to well water she drank before the state ordered her family's 80-foot well shut.

Mrs. Nappi says her son Mike, 19, "has had voice losses and bronchial problems that have doubled in the last couple of years without him having a cold." Her daughter, Rosemarie, 12, has had a rash on her back, shoulders and neck for the last four months, Mrs. Nappi said.

"They can't account for it," Mrs. Nappi said of her doctors.

"There are so many children around here showing the same symptoms — the bronchitis and the rashes — that it's pathetic," Mrs. Sheridan said. "All we want is clean water."

Threats of More Pollution

But the days of clean ground water may be numbered, not just in Lake Car-

Water Is Feared Spreading

mel but also in the metropolitan area and throughout the country.

Eckardt C. Beck, an expert on the subject and the Federal Environmental Protection Agency's assistant administrator for Water and Waste Management during the Carter administration, predicted in Congressional testimony last July that "thousands" of additional cases of ground water contamination would be found in the United States in coming years.

The House subcommittee on environment, energy and natural resources, before which Mr. Beck testified, called "ground water destruction one of the most serious environmental problems of the 1980's."

The chemicals already in the aquifers and threatening further contamination of wells are among thousands of synthetic organic compounds developed with the explosive growth of the chemical and petrochemical industries since World War II. Their multisyllabic names are tongue-twisters — trichloroethylene, tetrachloroethylene, vinyl chloride, 1,1,2-trichloroethane, carbon tetrachloride, benzene, toluene, xylene and methylene chloride.

Household Pollutants

The names may be alien, but the chemicals are pervasive. Most are petroleum-based and are found in gasoline, cesspool and septic tank cleaners, toilet bowl deodorizers, plastics, laundry degreasers and spot removers, household cleaners and disinfectants, paint and varnish removers, dry-cleaning fluids, degreasing agents for machinery, metals and engines, floor and furniture strippers and car waxes.

Millions of pounds of these chemicals have reached the ground water in many ways — principally, experts say, by seeping into aquifers from landfills where chemicals were routinely dumped before tough new environmental laws were passed in the 1970's, from the septic tanks of tens of thousands of rural and suburban homes and from ruptured underground gasoline and fuel oil storage tanks.

The Federal Environmental Protection Agency office in New York City has a newly computerized listing of about 1,200 hazardous-waste sites in New Jersey and New York that officials want to investigate and for which they want to begin planning possible clean-up programs. There are 400 in New Jersey, 20 in Suffolk, 16 in Nassau, 15 in Rockland, 16 in Putnam, 7 in Westchester, and about 600 elsewhere in New York State, according to John S. Frisco, chief of Hazardous Waste Unit in the office.

'No Easy Solution'

Unless Congress appropriates money for a $1.6 billion "superfund" — a major environmental bill enacted in the waning days of the Jimmy Carter Administration to finance landfill cleanup nationwide — Mr. Frisco's staff will have money only to investigate four of the most potentially harmful in New Jersey and two in New York, including one near Love Canal.

No money from the bill is earmarked for cleaning aquifers already contaminated by years of seepage from landfills, gasoline spills and septic tanks.

"There is no easy solution" to the tainted aquifers, Mr. Frisco said. "Once those aquifers become contaminated it is extremely expensive or almost impossible to clean up. You can't correct a problem that took 30 years to generate overnight. That's the real crime of it. It may take just as long to clean it up."

Once the chemicals reach the deep recesses of aquifers they congeal into "plumes" that move from a few feet to a few hundred feet each year, depending on the shape and composition of the geologic structures in the aquifer.

New Jersey's largest aquifer, the Cohansey, now has at least two big plumes in it, both originating from landfills. One that is about four miles long has ruined 150 wells in Jackson Township and prompted homeowners to argue that the poisoned water caused a host of ailments, cancer and kidney trouble among the most serious. Another plume in the Cohansey has moved within 3,000 feet of some of Atlantic City's municipal well supplies.

A mile-long plume that stretches from a dump in Babylon, L.I. has prompted homeowners to abandon their private wells and hook up to municipal water systems drawing on deeper wells.

Contamination for Years

Drilling into deeper, less-contaminated acquifers is the most common solution now. But there is no guarantee that toxic substances in aquifers near the surface will not leach into lower ones.

The chemicals do not go away. "Once contaminated, ground water can remain so for hundreds or thousands of years, if not for geologic time," according to the Federal Council on Environmental Quality, a Cabinet-level advisory body to the President.

Technology to purify ground water, still in its infancy, is very costly. There are two common treatments. One method involves attachment of granular activated carbon units to home water tanks or municipal wells; the carbon captures the toxic substances.

Aeration is the other common solution. Under this system, contaminated water is drawn up from aquifers, passed through a cooling tower, and then sprayed by nozzles into the air. Many toxic chemicals evaporate before the water hits the ground again and seeps into aquifers.

Even with these attempts to clean water supplies, the uncertainty remains about whether they can cause cancer and other ailments.

No studies exist on how much contaminated ground water must be consumed before a person has trouble with his central nervous system, another affliction thought to be caused by the organic chemicals.

Experts say, however, that the existing cancer risk formulas show that the toxic substances in ground water are less dangerous than other everyday risks.

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